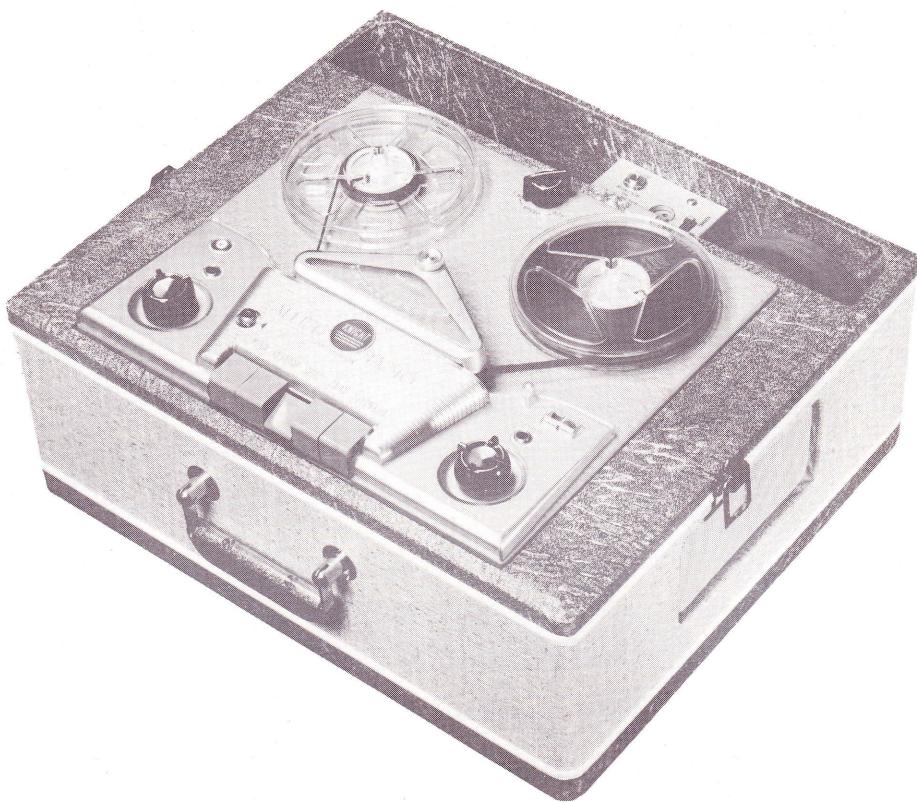


**KNIGHT  
MODELS 99RZ177, 99RZ936****GENERAL INFORMATION**

The Knight Models 96RZ936 and 99RZ177 features pushbutton control for playback, record, stop, fast forward and fast reverse. Double track recording is used doubling the recording time on a single reel of tape. Any reel size up to 7" can be used. Two neon indicator lights simplify the recording level setting. Recordings can be made from a radio, phonograph or television in addition to those made directly with the microphone. New recordings may be made on previously recorded tape because the erase head is automatically positioned when pressing the record button. Recordings may be played back through the built in speakers or an external speaker may be plugged into one of the External Speaker Jacks.

Using both tracks of the tape the recording time is as follows:

Size Reel	3 3/4" Speed	7 1/2" Speed
5" reel (600 ft.)	1 hour	1/2 hour
7" reel (1200 ft.)	2 hours	1 hour

The Knight is designed to operate on 115V, 60 cy. AC supply only. Before connecting to a line supply be absolutely certain it agrees with the above specifications.

**Supplied By:**

Allied Radio Corporation  
833 West Jackson Boulevard  
Chicago 7, Illinois

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**KNIGHT  
MODELS 99RZ177, 99RZ936**

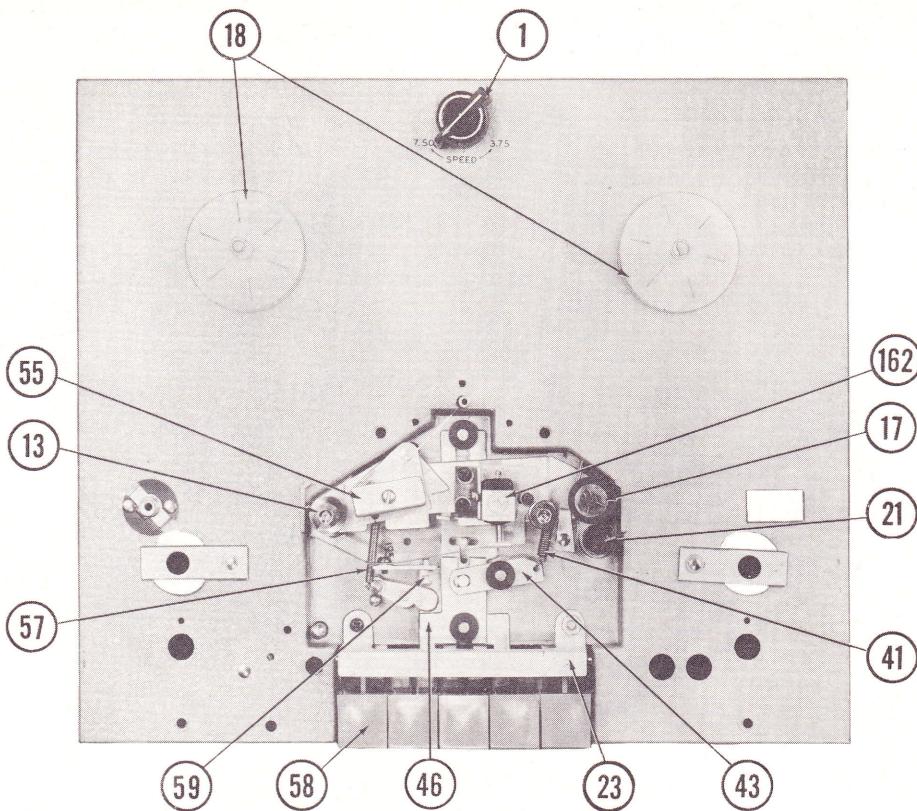


Figure 1

## OPERATING INSTRUCTIONS

### Preparation For Operation:

1. Remove the AC power cord, microphone, reel of tape and empty reel from the storage compartment.
2. Depress the stop button.
3. Plug the AC cord into a convenient wall receptacle of the proper rating.
4. Set speed control knob to 3.75 or 7.50 as desired.
5. Place "Remote-Normal" switch in "Normal" position.

**CAUTION:** Do not turn speed change knob unless "Stop" button is depressed.

When the Forward or Reverse buttons are depressed the Record and Playback buttons are locked so they cannot be depressed. This eliminates the possibility of spilling tape. The buttons must be depressed firmly until they latch, and the "Stop" button must be depressed before changing functions or speed of the recorder.

**IMPORTANT:** Always depress the "Stop" button when the unit is not in use. This prevents the pinch roller from becoming flattened against the capstan.

### Speed Change Knob:

This recorder has two speeds 3.75 inches per second or 7.5 inches per second. The arrow on the speed change knob should point at 3.75 or 7.50 according to the speed desired.

**CAUTION:** Always depress the "Stop" button before attempting to change speed. Turning the speed change knob while the unit is running will not change speed and can result in damage to the mechanism.

### Threading The Tape:

1. Place a full reel of tape on the left (supply) spindle, being certain the slots in the reel engage the protrusions on the spindle pan. Unwind about 14" of tape from the supply spindle.
2. Insert free section of tape into the tape slot. Place empty reel on the right (take-up) spindle.
3. Insert free end of tape into one of the slots in the empty reel hub. Hold the tape in place and turn the reel two or three turns until the tape is secured.
4. The dull side of the tape should face away from the operator and toward the rear of the unit.

### To Record From Microphone:

1. Turn the On-Off Volume control to the right

until a click is heard and then allow 30 seconds for the unit to warm up. The pilot light located above the "Stop" button will glow when the unit is turned on.

2. Insert the microphone plug into the "Microphone" jack.

3. Push the record lock button down with the left hand and hold. This releases the safety lock which prevents accidental erasure of recorded material.

4. Depress the "Record" button with the right hand until it latches. Release the lock button.

5. Adjust the "Volume" control until the "Normal" indicator just flashes while speaking into the microphone. If the "Volume" control is advanced too far the "Overload" indicator will flash and the recording will be distorted. To prevent overload and distortion turn the volume control down to a point where the "Overload" indicator does not flash.

6. The "Tone" control does not function during recording. When recording from a radio, set the radio tone control for maximum treble.

#### To Record From Radio, TV, Or Phonograph:

1. Insert the phonograph pick-up plug into the "Radio-P. A. -Phono" jack.

2. For radio or TV recording, connect patch cord, Part No. 96R674, to the voice coil of the radio or TV speaker by means of the alligator clips. Plug into the "Radio-P. A. -Phono" jack.

3. Proceed as described under "To Record From Microphone".

NOTE: Remove patch cord when recording is completed.

#### To Use Second Track:

1. Depress "Stop" button when all tape is wound on the take-up reel.

2. Remove reel containing tape and empty reel. Place full reel on left (supply) spindle and empty reel on right (takeup) spindle.

3. Thread tape and proceed as previously described.

#### To Play Recordings:

1. Turn unit on with volume control knob.

2. Thread tape as described under "Threading The Tape".

3. Set the speed change knob (1) to the speed at which the recording was made.

4. Depress the "Play" button until it latches.

5. Adjust "Volume" and "Tone" Controls to desired listening levels.

#### High Speed Forward Or Reverse:

When it is desirable to play a section of tape over again it is not necessary to play or rewind the

entire tape. By depressing the "Forward" or "Reverse" button the tape will advance or rewind at a rapid speed.

Several minutes of normal recording can be skipped in a few seconds by the "Forward" or "Reverse" buttons.

#### Tape Timer:

If, when making recordings or playing a recorded tape, you wish to play back a certain recording, note the reading on the time scale when a particular recording is being made or heard. Rewind the tape until that number appears on the scale, press the "Stop" button, then press the "Play" button and you will be listening to the desired recording.

When starting a new reel of tape or re-recording a reel, reset the indicator pointer to "0" by rotating the reset knob (5). By starting at "0" on all tapes, the number location can be catalogued for each selection on any reel.

#### To Edit And Splice Tape:

NOTE: It is impossible to edit and splice one track without affecting the second track of recorded material, therefore recordings to be edited should be limited to one track only.

1. The tape may be edited by cutting out unwanted sections, or by joining selections into another sequence. Announcements can be added between selections, etc. Unused sections of tape may be spliced together for re-use.

2. For best results cut tape at a slight diagonal, join ends together with splicing tape on the glossy side and trim off any excessive width.

#### Erasing Recorded Material:

When the "Record" button is depressed the erase head is automatically positioned to erase any previous recording before a new one is made. Material may be erased when no longer needed, without recording, by turning the volume control to the extreme counter-clockwise position, or minimum volume position, and depress the "Record" button. To erase the second track, reverse the reels and repeat the above operation.

#### To Use Recorder As A Public Address System:

Insert the Microphone into the "Microphone" input jack. Plug in an extension speaker, or speakers if desired, and depress the "Record" button. Set the "Volume" and "Tone" controls to the desired listening level. A recording can be made at the same time with a tape placed on the unit in the normal manner.

CAUTION: When using the unit as a public address system, the Microphone must be kept as far away from the speakers as possible to prevent "feedback" squeal.

#### Remote Control Operation:

A socket and switch are provided to allow remote operation up to a distance of 18 feet on either recording or playback. This is accomplished by remote control cable No. 96R636. Connect remote control cable as follows:

1. Set remote control cable switch at end of cable to "Standby" position.
2. Insert cable plug into remote socket.
3. Set the control switch on the remote socket to the "Normal" position. Start the recorder in the usual manner and set the "Volume" control to the proper level.
4. Set the control switch on the set to the "Remote" position. The tape will stop.

The recorder may now be operated (start and stop) by means of the remote cable switch. When starting the recorder by means of the remote control, the switch should be rotated to the "Motor" position and then to the "Record-Playback" position after a slight pause in the "Motor" position. To stop recording or playback, rotate the control switch directly to the "Standby" position, with just a slight pause at the "Motor" position.

## ADJUSTMENTS

### Record-Play Head Adjustment: (See Exploded View, Fig. 3A)

To adjust the record-play head (162) for maximum frequency response, adjust as follows:

1. Remove the rear escutcheon (6) and rear escutcheon plate (7).
2. Thread an alignment tape or a good recorded tape on the machine.
3. Set the controls as described under "To Play Recordings".
4. Adjust screw (33) by turning it in and out until the maximum high frequencies are obtained. Replace escutcheon and plate.

### Pressure Pad Adjustment:

1. Remove front escutcheon (11).
2. Depress the "Play" button. Do not turn the recorder on.
3. Using a pencil type postal scale, check the amount of pressure required to just pull the pad away from the tape. The test should be made on the end of the pressure pad mounting spring (60). Adjust the pressure pad for  $1\frac{3}{4}$  oz.  $\pm\frac{1}{4}$  oz. pressure.
  - (a) The record head pressure pad is adjusted by locked adjusting screw (59).
  - (b) The guide post pressure pad is adjusted by bending the pressure pad spring. It must be adjusted for minimum pressure against the tape.
4. After the adjustments depress the "Stop" button and replace the front escutcheon.

### Erase Head Adjustment:

1. With tape properly threaded, turn on recorder and depress the "Record" button. Allow tape to run for a few seconds and turn recorder off, leaving the "Record" button depressed.

2. With the escutcheons removed check the erase head (55) to see if it is parallel with the tape.

3. Check to see if the top edge of the tape coincides with the top end of the long diagonal slot in the erase head (Junction of long diagonal slot and short vertical slot). To adjust level of tape, loosen set screw (12) in left tape guide post, and rotate guide post to move tape up or down. Tighten set screw.

### Brake Shoe Adjustment:

1. In order to adjust the brake shoes it is necessary to remove the mechanism from the carrying case and disconnect the speaker.

2. With all buttons in the up position the brake shoes (91) should clear the drums (67) approximately  $1/8$  inch.

3. Depress the stop button while observing the brake shoes. Both brake shoes must contact the drums at the same time and with equal pressure.

4. Adjustment is made by bending the spring arms.

### Adjustment For Slow Take-Up Reel:

There are instances where the spring drive belt (61) stretches after a period of time. When this occurs the takeup torque will be insufficient to wind the tape properly on the take-up reel. In this case the belt should be replaced as follows:

1. Remove the rear escutcheon (6) and rear escutcheon plate (7). Remove the mechanism from the carrying case.

2. Loosen set screw (68) on brake drum (67) and slide take-up spindle (18) upward until the belt can be removed from the groove on the spindle.

3. Remove the belt from around the spindle and remove spindle. Remove the belt from around the pinch roller (17), and from the recorder.

4. Install new belt by reversing the above procedure.

### Bias Adjustment:

Turn the recorder on and depress the "Record" button using no tape. To determine if the bias is within satisfactory limits without dismantling the unit, merely connect a VTVM from the top lug of the recording head to chassis. If 75 to 100 volts are present no adjustment is necessary.

If the readings are outside of this range, proceed as follows:

1. Try a new 6AQ5T, 12AX7, 6AQ5, and 5Y3.

2. If still not within range, remove the chassis and connect a low capacity VTVM from test point "A" to ground. Adjust trimmer (C4B) for maximum reading. Adjust trimmer (C4A) to obtain a reading of 2.25 volts. This provides the optimum in performance.

### Neon Record Level Indicators:

The neon record indicator firing level adjust-

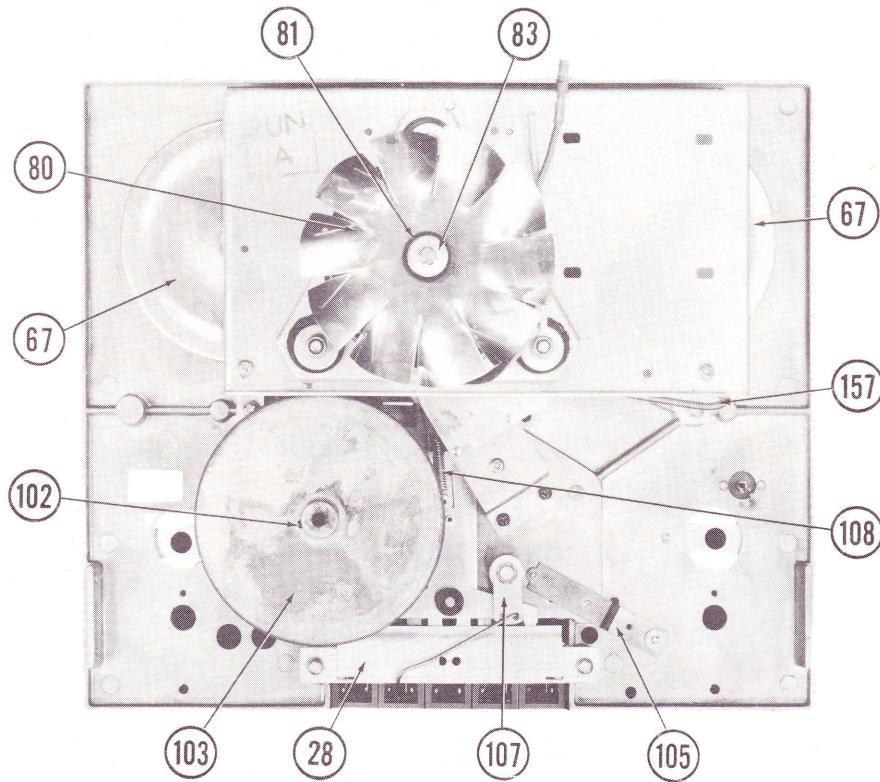


Figure 2

ment is required only if a bulb is replaced. The two neon indicators are adjusted for correct firing level by means of two trimmer capacitors, one for each indicator. Adjust as follows:

1. Turn recorder on and depress "Record" button.

2. Connect a short jumper lead across the bias oscillator coil, L1, to disable the oscillator.

3. Connect an audio oscillator, set at 1000 cycles, into the microphone input jack. Output of the audio oscillator should be approximately .01 volt. (A 1 volt output may be used with a 100 to 1 resistor reduction pad inserted between the audio oscillator and the Microphone jack).

4. Connect low capacity type AC VTVM to test point "B" (Junction of two 330K resistors, R28 and R29, mounted on a terminal strip near the volume control).

5. Adjust volume control to obtain a reading of 36 volts on the VTVM and leave control set and VTVM connected.

6. Disconnect shorting jumper from across bias oscillator coil.

7. Adjust "Normal" trimmer (C26A) fully clockwise and then turn slowly counterclockwise so that upon loosening the trimmer the "Normal" bulb barely lights. This adjustment must be made loosening the trimmer.

8. Again short out the bias oscillator coil and increase the volume control until a reading of 88 volts is obtained on the VTVM.

9. Remove short from bias oscillator coil.

10. Adjust the "Overload" trimmer (C26B) as in step 7 to just barely light the "Overload" indicator bulb.

**IMPORTANT:** Do not adjust the recording bias oscillator after setting the indicator light adjustments.

## TROUBLES

### Push Buttons Fail To Latch In Position:

Lock plate spring (27) loose or broken, resulting in lock plate (28) not being held against hinge bracket (26).

### Fails To Erase:

1. Spring (57) loose or broken, not pulling the erase head forward against the tape.  
 2. Erase head not properly aligned. See "Erase Head Adjustment".

### No Fast Forward Or Reverse:

1. Idler lever tension spring (90), may be loose or broken, not actuating idler lever.  
 2. Check drive belt (100) to see if it is properly

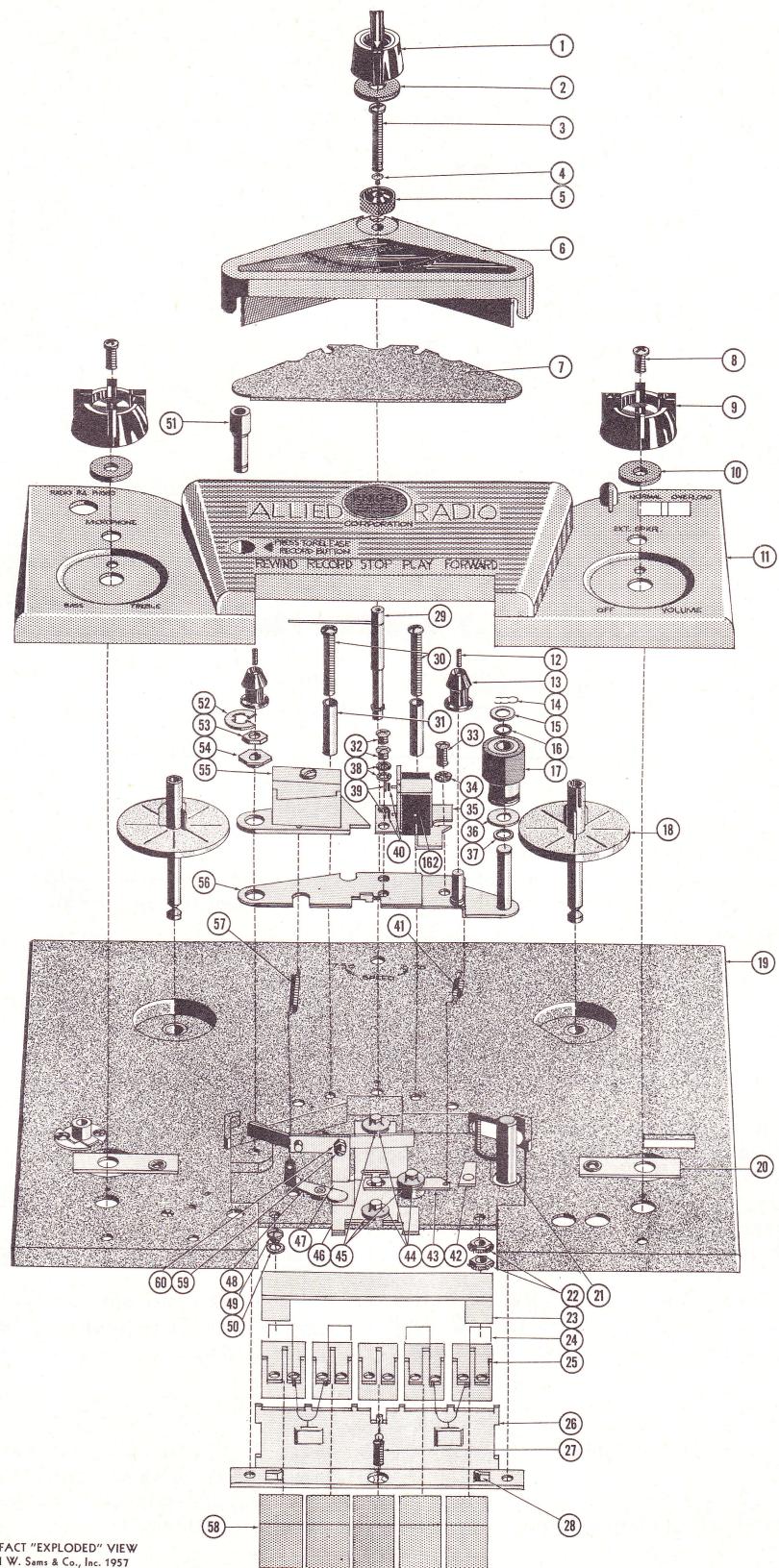


Figure 3A. Exploded View Of Parts Above The Baseplate

**KNIGHT  
MODELS 99RZ177, 99RZ936**

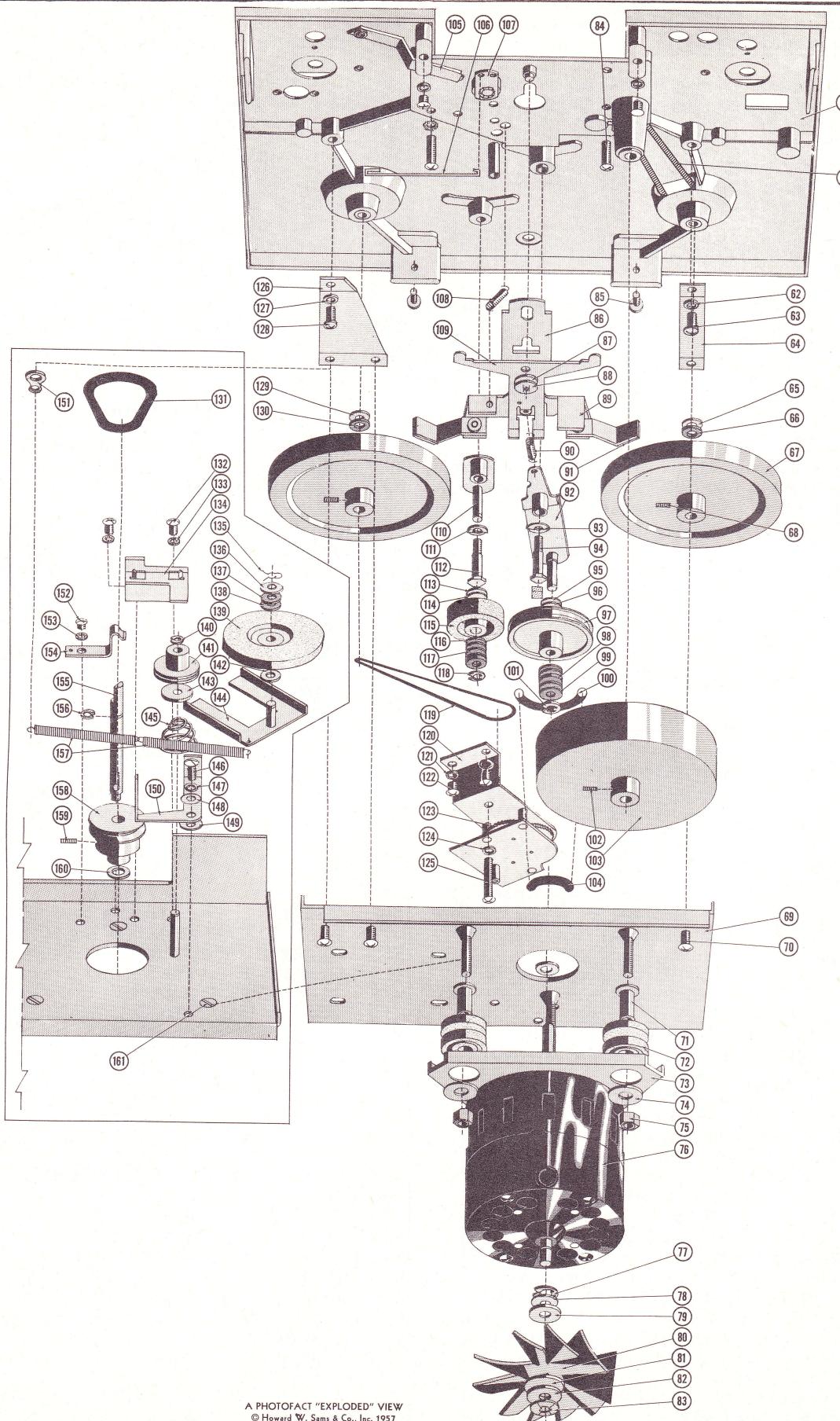


Figure 3B. Exploded View Of Parts Below The Baseplate

connected.

No Drive On Record Or Playback:

1. Idler tension spring (157) loose or broken, thereby not holding idler wheel (139) in proper contact with motor pulley (158) and flywheel (103).

2. Idler slide plate (144) binding on slide bushing (141) preventing idler wheel (139) from moving forward.

Tape Fails To Wind On Take-Up Reel During Record Or Playback:

1. Reel drive spring (61) loose or broken. See "Adjustment For Slow Take-Up Reel".

2. Brake drum shaft (Part of 18) binding. Clean foreign matter from bearing surface and lubricate.

Speed Variation Or WOW:

1. Check capstan (21), pinch roller (17), idler wheel (139), flywheel (103) and motor pulley (158) for foreign matter or oil on the driving surfaces. Clean these parts with a good cleaning fluid.

2. Check motor pulley (158) to see if it is secured to motor shaft.

3. Check idler tension spring (157) for holding idler wheel in firm contact with motor pulley (158) and flywheel (103).

4. Idler slide plate (144) binding on slide bushing (141) preventing idler wheel (139) from making positive contact with motor pulley and flywheel.

## CLEANING

The capstan (21) record head (162) and pressure roller (17) are subject to an accumulation of tape coating residue, which is worn off the tape when it passes these parts. Use a soft cloth and alcohol to clean these parts.

**CAUTION:** Do not use a brush or metal object to clean the recording head as this could mar the metal pole piece.

## LUBRICATION

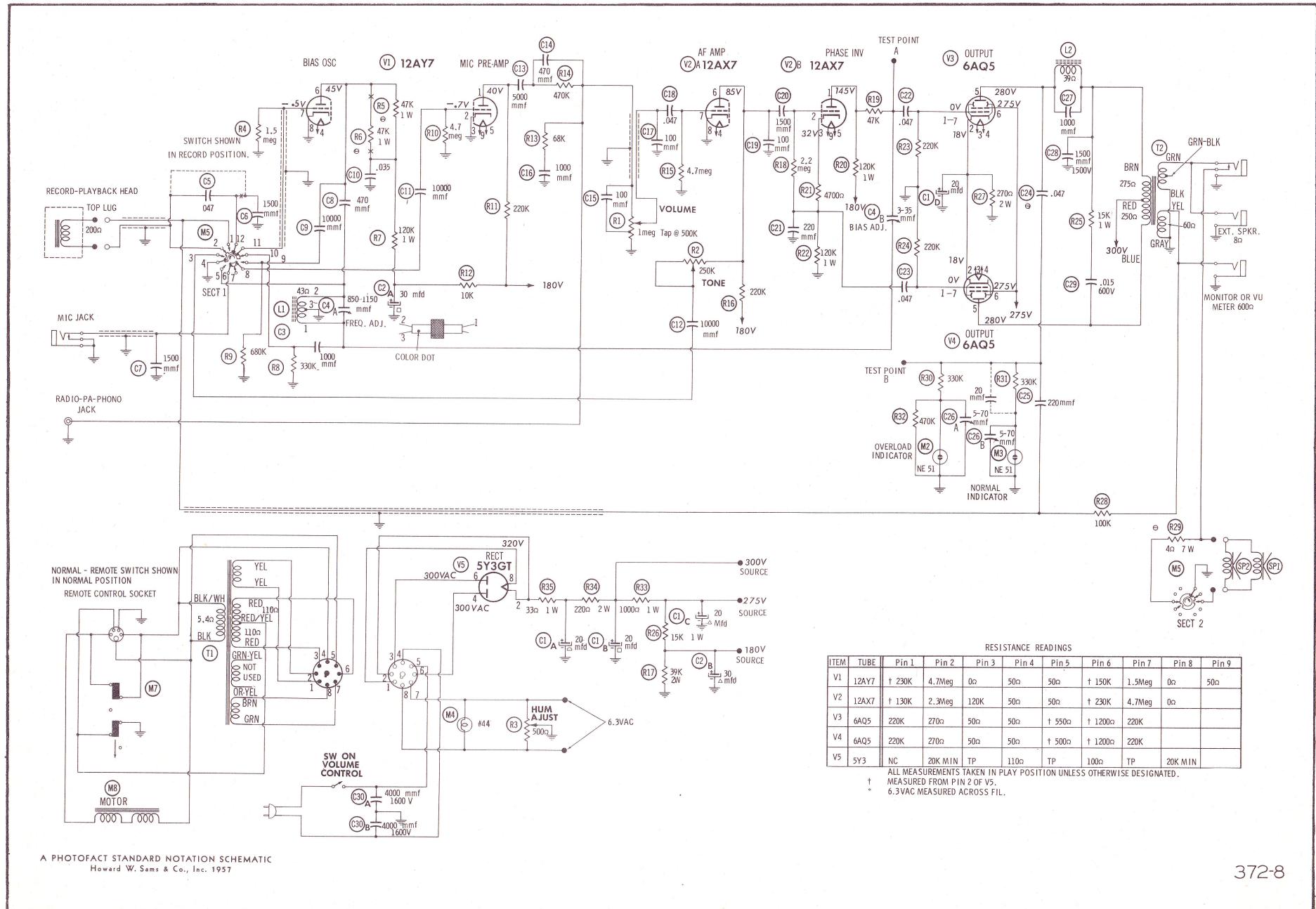
All rotating parts are provided with generous size oilite bearings, which are factory lubricated and requires no further attention.

An occasional cleaning out of foreign matter under the plastic pushbutton cover is desirable, and a small drop of oil on the sliding lever members is advisable.

## MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	C-130253	Speed Shift Knob, Maroon
2	73-2254-3	Felt Washer
3		Screw #6-32 Phillips RHMS
4		Screw #4-36 Phillips OHMS
5	B-32.302-2	Timer Knob
6	D-13.292-2	Rear Escutcheon, Silver
7	B-19.975-3	Rear Escutcheon Plate, Gray
8		Screw #8-32 Phillips RHMS (2 Used)
9	C-13.254-13	Control Knobs, Gray
10	73-2254-3	Felt Washer (2 Used)
11	E-13.293-5	Front Escutcheon, Silver
12		#6-32 Bristol Head Set Screw (2 Used)
13	B-32.309	Tape Guide Post (Right)
	B-32.300D	Tape Guide Post (Left)
14	B-33.409	Hairpin Clip
15	73-2340	Linen Washer
16		Steel Washer
17	B-33.404E	Pinch Roller
18	B-13.262-8	Reel Pan (2 Used)
19	D-35.807-6G	Base Plate Assembly, Gray
20	B-19.985-1A	Jack Mounting Bracket (2 Used)
21	B-32.259-1G	Capstan Shaft
22	48-2219-1	#6-32 Hex. Nut (2 Used)
23	B-19-858	Push Button Retainer Bracket
24	B-31.337-B	Push Button Return Spring (2 Used)
25	B-19.876-D	Push Button Lever (5 Used)
26	B-19.859-1J	Hinge Bracket For Push Buttons
27	B-31.343-A	Lock Plate Spring
28	B-19.870-C	Push Button Lock Plate
29	35-851	Timer Shaft And Pointer Assembly

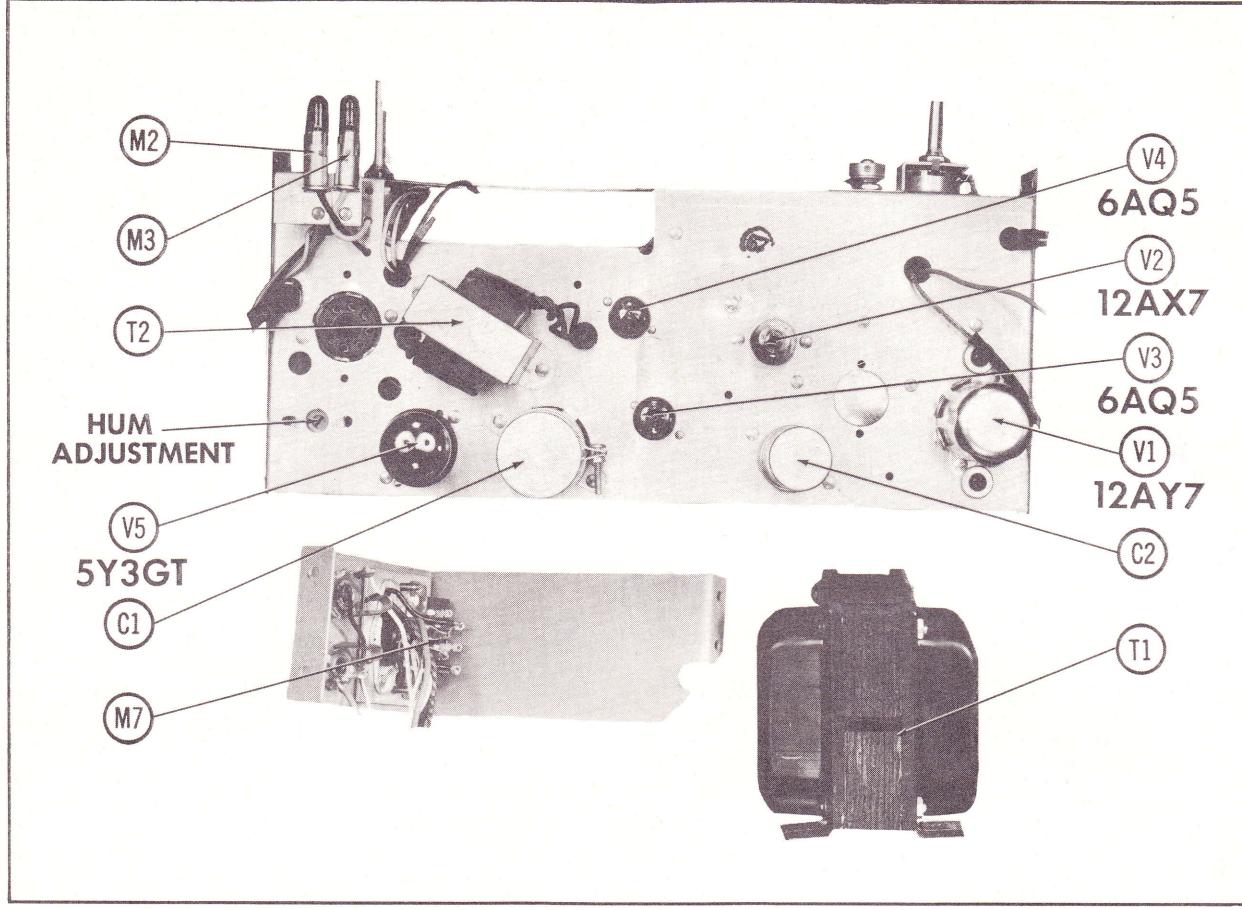
Ref. No.	Part No.	Description
30		Screw #6-32 Phillips RHMS
31	B-33.446	Spacer (2 Used)
32		Screw #6-32 RHMS (2 Used)
33		Screw #6-32 RHMS
34	73-2231-4	#6 Lockwasher, Int.
35	B-35.854	Head Mounting Bracket Assy.
36	73-2340	Linen Washer
37		Steel Washer
38	73-2231-4	#6 Lockwasher, Int. (2 Used)
39		#2-56 Hex Nut, C.P. (2 Used)
40	73-2233-1	#2 Int. Lockwasher (2 Used)
41	B-31.336-F	Pinch Roller Tension Spring
42	B-19.884-B	Hold Down Bracket
43	B-19.881-C	Playback Actuating Lever
44	B-33.412	Push-On Stud Nut, 3/16 Stud (3 Used)
45	73-2241-148F	Flat Washer
46	B-19.868A	Record Slide Plate
47	B-35.758	Playback Slide Plate Assy.
48	B-35.766-C	Record Actuating Lever Assembly
49		Screw #6-32 BHMS, Phillips
50	73-2231-4	#6 Int. Lockwasher Stl. C.P.
51	B-32.308-4	Record Lock Release Button
52	33.415	"E" Retaining Ring
53	48-1C-13-1	#6-32 Hex Nut, Steel C.P.
54	B-32.260-D	Tape Guide Post Spacer
55	B-35.794	Erase Head And Plate Assy.
56	B-35.824-B	Pinch Roller Plate Assembly
57	B-31.347-B	Erase Head Tension Spring
58	B-35.755-5	Push Button Assembly, Gray (5 Used)
59		#6-32 RHMS Steel C.P.
60	48-410-1	#6-32 Locknut
61	B-31.351A	Reel Drive Spring (Tension)
62	73-2231-5	#8 Int. Lockwasher



## PARTS LIST AND DESCRIPTIONS

### TUBES (GENERAL ELECTRIC, SYLVANIA)

## CHASSIS—TOP VIEW



ITEM No.	USE	TYPE	NOTES	ITEM No.	USE	TYPE	NOTES
V1	Bias Osc. & Mic. Preamp.	12AY7		V4	Output	6AQ5	
V2	A.F. Amp. & Phase Inv.	12AY7		V5	Rectifier	5Y3GT	
V3	Output	6AQ5					

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING	VOLT	KIGHT PART No.	AEROVox PART No.	REPLACEMENT DATA		NOTES
					CORNELL-DUBILIER PART No.	MALLORY PART No.	
C3	1000	1150	C-4.109-9	SH1000	D6-102	LT671	GP-1000
C4A	850-	1150	C-4.142				5GA-D1
B	3.35	200	D-4.148-91	BPD-05	DF-503	CUBAS47	Dual
C5	.047	1500	C-4.109-13	SH1500	D6-152	LT615	GEM-4147
C7	1500	1500	C-4.109-13	SH1500	D6-152	LT615	5GA-D15
C8	470	1500	C-4.115-19	SH470	D6-471	LT6747	5GA-T47
C9	10000	400	D-4.148-56	BPD-01	ID-103	BYA651	5HK-S1
C10	.035	400	D-4.148-56	BPD-01	DD-103	BYA651	5HK-S1
C11	10000	10000	C-4.115-19	BPD-01	DD-103	BYA651	5HK-S1
C12	10000	10000	C-4.115-19	BPD-005	DD-502	BYA1005	5HK-D5
C13	5000	5000	C-4.115-18	SH470	D6-471	LT6747	5GA-T47
C14	470	1000	C-4.109-18	SH100	D6-101	LT671	GP-100
C15	100	100	C-4.109-10	SH1000	D6-102	LT61D1	5GA-T1
C16	1000	1000	C-4.109-9	SH100	D6-101	LT671	GP-100
C17	.047	100	D-4.148-91	BPD-05	IDF-503	CUBAS47	5GA-T1
C18	.047	200	D-4.148-91	SH100	D6-101	LT671	GEM-4147
C19	100	100	C-4.109-10	SH1500	D6-162	LT615	5GA-T1
C20	2200	2200	C-4.109-13	NPO-S1220	D6-221	L10722	5HK-D5
C21	.047	400	D-4.148-27	BPD-05	IDF-503	CUBAS47	4TM-S47
C22	.047	400	D-4.148-91	BPD-05	IDF-503	CUBAS47	4TM-S47
C23	.047	400	D-4.148-91	BPD-05	IDF-503	CUBAS47	4TM-S47
C24	.047	400	D-4.148-91	NPO-S122	D6-221	L10722	4TM-S47
C25	109	220	C-4.109-27				MS-322
C26A	5.70	B-4.149-45	B-4.149-45				Dual
B	.5-7.0						10%
C27	1000	1500	D-4.104-88				MS-21
C28	1500	1500	B-4.129-7	HYD-15-	IRSD1	HD15-1510	10%
C29	.015	600	D-4.148-87	BPD-015	1500	HC16D15	
C30A	1600	1600	B-4.131-1	DD30-152	1500	HC16D15	
B	1600	1600		ID6-153	1500	HVE6D15	
					1500	HVE6D4	
						6TM-S15	
						Dual	

Capacity values given in the rating column are in microfarads for Paper Capacitors, and in microfarads for Mica and Ceramic Capacitors.

## FIXED CAPACITORS

ITEM No.	RATING	VOLT	KIGHT PART No.	AEROVox PART No.	REPLACEMENT DATA		NOTES
					CORNELL-DUBILIER PART No.	MALLORY PART No.	
C3	1000	1150	C-4.109-9	SH1000	D6-102	LT671	GP-1000
C4A	850-	1150	C-4.142	BPD-05	DF-503	CUBAS47	5GA-D1
B	3.35	200	D-4.148-91	SH1500	D6-152	LT615	5GA-D15
C5	.047	1500	C-4.109-13	SH1500	D6-152	LT615	5GA-T47
C7	1500	1500	C-4.109-13	SH1500	D6-152	LT615	5HK-S1
C8	470	1500	C-4.115-19	SH470	D6-471	LT6747	5HK-S1
C9	10000	400	D-4.148-56	BPD-01	ID-103	BYA651	5HK-S1
C10	.035	400	D-4.148-56	BPD-01	DD-103	BYA651	5HK-S1
C11	10000	10000	C-4.115-19	BPD-01	DD-103	BYA651	5HK-S1
C12	10000	10000	C-4.115-19	BPD-005	DD-502	BYA1005	5HK-D5
C13	5000	5000	C-4.115-18	SH470	D6-471	LT6747	5GA-T47
C14	470	1000	C-4.109-18	SH100	D6-101	LT671	GP-100
C15	100	100	C-4.109-10	SH1000	D6-102	LT61D1	5GA-T1
C16	1000	1000	C-4.109-9	SH100	D6-101	LT671	GP-100
C17	.047	100	D-4.148-91	BPD-05	IDF-503	CUBAS47	5GA-T1
C18	.047	200	D-4.148-91	SH100	D6-101	LT671	GEM-4147
C19	100	100	C-4.109-10	SH1500	D6-162	LT615	5GA-T1
C20	2200	2200	C-4.109-13	NPO-S1220	D6-221	L10722	5HK-D5
C21	.047	400	D-4.148-27	BPD-05	IDF-503	CUBAS47	4TM-S47
C22	.047	400	D-4.148-91	BPD-05	IDF-503	CUBAS47	4TM-S47
C23	.047	400	D-4.148-91	BPD-05	IDF-503	CUBAS47	4TM-S47
C24	.047	400	D-4.148-91	NPO-S122	D6-221	L10722	4TM-S47
C25	109	220	C-4.109-27				MS-322
C26A	5.70	B-4.149-45	B-4.149-45				Dual
B	.5-7.0						10%
C27	1000	1500	D-4.104-88				MS-21
C28	1500	1500	B-4.129-7	HYD-15-	IRSD1	HD15-1510	10%
C29	.015	600	D-4.148-87	BPD-015	1500	HC16D15	
C30A	1600	1600	B-4.131-1	DD30-152	1500	HC16D15	
B	1600	1600		ID6-153	1500	HVE6D15	
				1500	1500	HVE6D4	
					1500	6TM-S15	
						Dual	

① Some versions use a .035 capacitor. ② 600V in this application.

## CONTROLS

ITEM No.	RATING	RESISTANCE	WATTS	KIGHT PART No.	REPLACEMENT DATA		NOTES
					CORNELL-DUBILIER PART No.	IRC CLAROSTAT PART No.	
R1A	1Meg	1/2	C-8.227-2	BT-71	A47F5-1Meg	Q19-137X	UT-443
B	Switch			KB-1	Not Req.	76-1	Volume Tap @ 500K
R2A	250K	1/2	C-8.231-1	A47-250K-S	Q1-130	U46	Tone
B	Shaft			AB-5	Not Req.	U2	Hum Adjust
R3A	500Ω	1/2	C-8.207-7	AB-4	Q1-103	Not Req.	
B	Shaft			AK-1	FKS-1/4	RQ	

## INSTALLATION NOTES

Volume Tap @ 500K

Tone

Hum Adjust

## PARTS LIST AND DESCRIPTIONS (Continued)

### RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	REPLACEMENT DATA		REPLACEMENT DATA		NOTES	
		KNIGHT PART No.	IRC PART No.	ITEM No.	KNIGHT PART No.	IRC PART No.	
R4	1.5Meg	BT5-1.5Meg		R20	120K	D-7.102-112	BTAA-120K
R5	47K	BT4-47K		R21	4700	D-7.101-44	BTAA-4700
R6	120K	BT4-120K		R22	120K	D-7.101-112	BTAA-120K
R7	320K	BT4-320K		R23	220K	D-7.101-114	BTAA-220K
R8	680K	BT5-330K		R24	200K	D-7.101-114	BTAA-200K
R9	220K	BT5-680K		R25	15K	D-7.102-72	BTAA-15K
R10	4.7Meg	BT5-4.7Meg		R26	15K	D-7.102-72	BTAA-15K
R11	220K	BT5-220K		R27	270K	53-2825	BTAA-270
R12	10K	BT5-10K		R28	100K	D-7.101-100	PWA-100K
R13	68K	BT5-68K		R29	4	7	PWA-4
R14	470K	BT5-470K		R30	330K	D-7.101-121	BTAA-330K
R15	4.7Meg	BT5-4.7Meg		R31	330K	D-7.101-121	BTAA-330K
R16	220K	BT5-220K		R32	470K	D-7.101-128	BTAA-470K
R17	39K			R33	1000R	D-7.102-23	BTAA-1000
R18	2.2Meg	BT5-2.2Meg		R34	220K	2	BTAA-220
R19	47K	BT5-47K		R35	330	1	D-7.102-227
		D-7.101-86					BTAA-33

Note 1. Some versions may use a single 22K 1 Watt resistor.

Note 2. Some versions may use a 3.3Ω 7 Watt resistor.

### TRANSFORMER (POWER)

ITEM No.	RATING	REPLACEMENT DATA		REPLACEMENT DATA		NOTES
		KNIGHT PART No.	IRC PART No.	Haldorson PART No.	Merit PART No.	
T1	117VAC 600VCT 5V ③ .59A	SEC. 1 ③ .075A	SEC. 2 ③ .2A	D-9278-0	P9304 ②	
	SEC. 3 6.3V ③ 1.8A	SEC. 4 6.3V * ③ .0A	SEC. 5 6.3V ③ .0A			* This Winding Not Used. ① Use Universal Mag. Bracket. ② Tape Center Tap On 6.3V Winding.

### TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	REPLACEMENT DATA		REPLACEMENT DATA		NOTES
		KNIGHT PART No.	Haldorson PART No.	Merit PART No.	Stancor PART No.	
T2	7900R 3-4Ω CT SFC. 2 600Ω	C-9277-B				* Note - Center Tap Not Used.

### COILS (RF-IF)

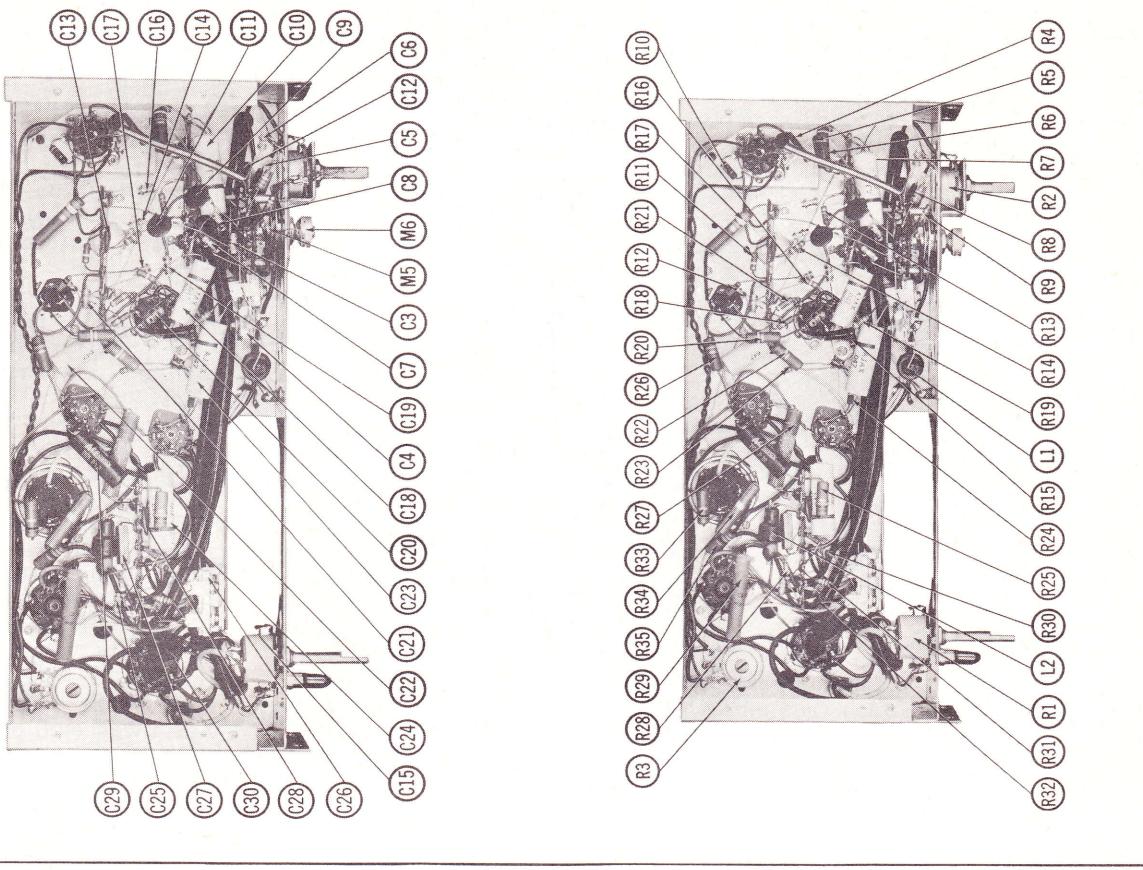
ITEM No.	USE	REPLACEMENT DATA		REPLACEMENT DATA		NOTES
		KNIGHT PART No.	MEISSNER PART No.	KNIGHT PART No.	QUAM PART No.	
L1	Bias Osc. Trap Coil	B-1.557 B-1.556				8.5 Millihenries 8.2 Millihenries

### SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		REPLACEMENT DATA		NOTES
		KNIGHT PART No.	QUAM PART No.	KNIGHT PART No.	QUAM PART No.	
SP1	5" x 7"	PM 6-80	30-341-2	57A1Z3	57A1Z3	
SP2	5" x 7"	PM 6-802	30-341-2	57A1Z3	57A1Z3	

### MISCELLANEOUS

ITEM No.	PART NAME	KNIGHT PART No.		REPLACEMENT DATA		NOTES
		FIELD SIZE	V. C. IMP.	KNIGHT PART No.	QUAM PART No.	
M1	Erase Head Assy.	B-35-794				
M2	Indicator Light	45-2036-1				Neon -
M3	Indicator Light	45-2036-1				#44
M4	Pilot Light					Function - (Rotary Water Type)
M5	Switch	B-11-247				
M6	Switch Lever Assy.	B-35-859-1				Normal - Remote (Slide Type - DPDT)
M7	Switch					
M8	Motor					



MODELS 99R277, 99R2936  
KINGHT

**MECHANICAL PARTS LIST (CONTINUED)**

Ref. No.	Part No.	Description
63		#8-32 Screw, RHMS Phillips
64	B-19.862C	Angle Bracket For Mounting Drive Assembly
65	B-28.163	Linen Washer
66	73-2241-134	Flat Washer (1 or 2 Used)
67	C-35.823-1E	Brake Drum And Bushing Assembly (2 Used)
68		#8-32 BHM Screw (2 Used)
69	D-35.753-1	Drive Mounting Plate
70		#8-32 BHM Screw
71		Spacer, Motor Mounting (Part of Item 72)
72	B-28.159	Shock Mount
73	C-19.837-F	Motor Adapter Plate
74	B-33.411-A	Flat Washer
75	48.409-1	Hex Nut
76	D-36.153-E	Motor, Round Type (Fasco)
	D-36.154G	Motor, Square Type (GI and Alliance)
77	B-33.418	Truanc Retaining "E" Ring
78	73.2241-143	Flat Washer
79	73-2254-3	Felt Washer
80	C-119.887-1	Fan Blade
81	73-2254-3	Felt Washer
82	73-2241-143	Flat Washer
83	33.415	Push-On Fastener (Presthole)
84		#8-32 RHM Screw, Phillips (2 Used)
85		#8-32 RHM Screw, Phillips (2 Used)
86	C-35.835	Brake Slide Plate Assembly
87	B-28.163	Linen Washer
88	B-33.412	Push-On-Stud Nut, 3/16" Stud
89	B-35.764	Pressure Pad Spring Assy.
90	B-31.339-C	Idler Lever Tension Spring
91	B-31.335A	Brake Pad, Felt (2 Used)
92	B-35.834-2	Idler Lever Assembly
93		Bent Washer
94	B-32.275-1E	#8-32 HH Shoulder Screw
95	28.173	Phenolic Washer
96	28.173	Phenolic Washer
97	B-33.406-D	Idler Drive Sheave
98	73-2254-6	Felt Washer (1 or 2 Used)
99	73-2241-150	Steel Washer (1 or 2 Used)
100	B-28.181	Idler Drive Belt
101	B-33.418	Truarc Retaining "E" Ring
102		#8-32 BHS Screw
103	C-13.257-1C	Flywheel
104	B-28.181	Idler Drive Belt
105	B-35.774	Record Interlock Assembly
106	B-31.333	Switch Arm Link
107	B-35.859-1	Switch Lever Assembly
108	B-31.338-B	Brake Return Spring
109	B-35.759-1	Shift Plate Assembly
110	B-35.757D	Sub Idler Plate Assembly
		Bent Washer
111	B-32.275-1E	#8-32 HH Shoulder Screw
112		Phenolic Washer
113	28.173	

Ref. No.	Part No.	Description
114	28.173	Phenolic Washer
115	B-35.405-F	Sub Idler
116	73-2254-6	Felt Washer (1 or 2 Used)
117	73-2241-150	Flat Washer, Steel (1 or 2 Used)
118	B-33.418	Truarc Retaining "E" Ring
119		Timer Drive Belt
120	D-33.445	Gear Train Mounting Bracket, Tape Index
121	73-2331-4	#6 Int. Lockwasher
122		#6-32 Phillips RHM Screw
123	D-33.445-A	Tape Index Gear Train
124	73-2331-4	#6 Int. Lockwasher
125		#6-32 Phillips RHM Screw
126	B-19.863	Drive Mounting Plate Bracket
127	72-2231-5	#8 Int. Lockwasher
128	B-28.163	#8-32 RHM Screw, Phillips
129		Linen Washer
130	73-2241-143	Flat Washer, Steel (1 or 2 Used)
132		#6-32 Phillips RHM Screw (2 Used)
133	73-2231-4	#6 Int. Lockwasher
134	51-3182	Shift Plate For Fast Speed
135	B-33.409	Hairpin Clip
136	73-2241-150	Steel Washer (1 or 2 Used)
137	B-28.163	Linen Washer (1 or 2 Used)
138	73-2238-49	Phenolic Washer (1 or 2 Used)
139	B-33.408C	Rubber Bonded Idler Wheel 2 1/2" Dia.
140	B-33.407-1	"C" Washer
141	B-32.264-F	Idler Slide Bushing
142	B-28.163	Linen Washer
143		Steel Washer
144	B-35.768-A	Idler Slide Plate Assembly
145	B-31.327-D	Idler Lift Spring
146		#8-32 RHM Screw
147	73-2241-150	Steel Washer
148	B-32.291-1	Shoulder Washer
149		Steel Washer
150	110-47	Idler-Throw-Out-Lever
151		Idler Tension Spring Clip
152		#6-32 RHM Screw, Phillips
153	73-2231-4	#6 Int. Lockwasher
154	B-19.961	Speed Control Shaft Detent Spring
155	C-35.816-1	Speed Control Shaft Assembly
156	33.469	Truarc Retaining Ring
157	B-31.324-A	Idler Tension Spring (2 Used)
158	B-32.288-D	Motor Drive Pulley
159		#8-32 B. H. S. Screw
160	73-2238-49	Phenolic Washer
161		Motor Mounting Screw (3 Used)
162	C-36.156-E	Tape Recording Head/Shure TR16A